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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/817,154	03/27/2001	Norihiko Kiritani	50195-257	7093

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EXAMINER	
TOLEDO, FERNANDO L	

ART UNIT	PAPER NUMBER
2823	

DATE MAILED: 12/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/817,154	KIRITANI, NORIHIKO	
	Examiner	Art Unit	
	Fernando Toledo	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *19 and 20* is/are withdrawn from consideration.

5)☒ Claim(s) *1-12* is/are allowed.

6)☒ Claim(s) *13-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 March 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *20031022* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 13 – 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palmour, John (U. S. patent 5,459,107) in view of Ueno, Katsunori (U. S. patent 6,265,326 B1).

In re claims 13 and 18, Palmour in the U. S. patent 5,459,107; figures 1A – 4C and related text discloses forming a gate oxide film on a surface of a SiC substrate; and annealing the gate oxide film.

Palmour does not show wherein the annealing takes place in a water rich environment at a temperature equal to or lower than the substrate temperature at which the gate oxide film is formed after stopping the supply of the O_2 rich ambient, the H_2O partial pressure of the water rich environment is larger than the H_2O partial pressure of the O_2 rich ambient at a temperature of about 700°C – 1050°C.

Ueno, in the U. S. patent 6,265,326 B1; 1 – 4 and related text, discloses that to increase the rate of speed of formation of a thermal oxide film of a silicon carbide semiconductor device, the partial pressure of water is controlled within a range of 0.1 to 1 (Figure 4) and after stopping a supply of O_2 rich environment, the H_2O partial pressure of the water rich environment is larger

than the H_2O partial pressure of the O_2 rich environment (Column 3, Lines 57 – 60) at a temperature of about 1000°C (Column 3, Line 64).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to anneal in a water rich environment at a temperature equal to or lower than the substrate temperature at which the gate oxide film is formed after stopping the supply of the O_2 rich ambient, the H_2O partial pressure of the water rich environment is larger than the H_2O partial pressure of the O_2 rich ambient at a temperature of about 700°C – 1050°C in the invention of Palmour, since as taught by Ueno, to increase the rate of speed of formation of a thermal oxide film of a silicon carbide semiconductor device, the partial pressure of water is controlled within a range of 0.1 to 0.95 at a temperature of about 1000°C.

Palmour in view of Ueno, does not disclose so as to reduce interface density between the gate oxide as in the instant application.

The recited results would be obtained because the same materials are treated in the same manner as in the instant invention.

3. In re claim 14, Palmour in view of Ueno teaches wherein the partial pressure of H_2O in the water rich environment is kept more than 0.95 (Figure 4 of Ueno).

4. In re claim 15, Palmour in view of Ueno discloses wherein the O_2 rich environment is implemented by a mixture of O_2 and H_2O (Column 3, Lines 57 – 60).

5. In re claim 16, Palmour in view of Ueno teaches wherein H_2O partial pressure in the O_2 rich environment is kept less than 0.95 (Figure 4 of Ueno).

6. In re claim 17, Palmour discloses depositing a silicon film 13 at the surface of the SiC substrate; annealing the SiC substrate to grow the gate oxide film at the surface of the SiC substrate (Figure 3B).

Palmour does not disclose annealing in water rich environment and annealing the gate oxide film in a water rich environment at a substrate temperature equal to or lower than the substrate temperature at which the gate oxide film is formed so as to reduce interface density between the gate oxide film and the SiC substrate.

Ueno discloses that to increase the rate of speed of formation of a thermal oxide film of a silicon carbide semiconductor device, the partial pressure of water is controlled within a range of 0.1 to 1 (Figure 4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made annealing in water rich environment and annealing the gate oxide film in a water rich environment at a substrate temperature equal to or lower than the substrate temperature at which the gate oxide film is formed so as to reduce interface density between the gate oxide film and the SiC substrate in the invention of Palmour, since as taught by Ueno, to increase the rate of speed of formation of a thermal oxide film of a silicon carbide semiconductor device, the partial pressure of water is controlled within a range of 0.1 to 0.95.

Palmour in view of Ueno does not disclose so as to reduce interface density between the gate oxide as in the instant application.

The recited results would be obtained because the same materials are treated in the same manner as in the instant invention.

Allowable Subject Matter

7. Claims 1 – 12 are allowed over the prior art of record.

Response to Arguments

8. Applicant's arguments with respect to claims 13 – 18 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fernando Toledo whose telephone number is 703-305-0567. The examiner can normally be reached on Mon-Fri 8am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

George Fourson
Primary Examiner
Art Unit 2823

FToledo